Towards PDR

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Meeting with NSF
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Outline

- Dual agency project office aspects
- Progress to PDR
- Project development funding priorities
- Pre-PDR review recommendations

Project Office Issues

- NSF & DOE scope handled by a single project office, integrated management team
  - Many benefits: shared expertise etc.
- But different timelines for NSF & DOE:
  - Fall 2017 DOE CD-1
  - Jan 2018 NSF PDR
    - "CD-2-like", but different handling of risk analysis & contingency estimation
    - But no pre-review EV status reporting
  - Fall 2018 DOE CD-2
- Develop project more synchronously than agency timelines
  - E.g. full RLS for NSF & DOE scope by summer 2017

Going Forward: L2 Systems

- Status of NSF-funded systems:
  - Significant progress since pre- PDR (which was held as things were accelerating), both in project development and team knowledge

System	RLS v1	BOE & RLS v1 Scrubbing	Bottom-up contingency (uncertainty)	v1 Complete	RLS v2 Target
6.4 LAr	Complete	60% done	5/31	5/31	7/15
6.5 Tile	Complete	Complete	Complete	3/15	6/15
6.6 Muon	Complete	5/22	6/15	6/15	7/31
6.8 Trigger	Schedule 100% Loading 50%	6/10	6/30	6/30	8/15

Current Timeline

- Here items that involve L2, L3, CAMs, ICs
  - RLS, BOE, risk register, etc.
- May DR turned into thorough 6-system scrubbing marathon
  - Some external help, but less formal than DR

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
RLS Loading & Scrubbing				DR	RLS Loading & Scrubbing		RLS rescrubbing				DR	PDR
		Milestones		DR	Milestones		Milestones - tiered				DR	PDR
BOEs v1				DR	BOEs v2			BOEs v3			DR	PDR
		Task-level maturity		DR	Task-level maturity						DR	PDR
		Risk Register v1		DR	Risk Register	Enter risk tasks & run MC					DR	PDR
		Technical specs v1		DR				Technical specs v2			DR	PDR
				DR				Large procurements		Finalize doc	DR	PDR

NSF mini-review

NSF mini-review DR

Deliverables

Deliverable	Current Status	Delivery Date	Responsible
WBS & RLS	70% (NSF)	October 2017	Brooijmans
Cost Model Data Set	Not yet	October 2017	Guo
Risk/contingency	20%	October 2017	Risk Management Team
PMCS	Done	Done	
Feasibility	R&D	December (TDRs)	Evans (ATLAS)
Project Execution Pl	v2		PO
Project Developm. Pl.	Draft is PEP Chap 3	July 2017	Tuts
Interface specs	Draft v2	May 2017	ATLAS TDAQ
ES&H Plan	Done	Done	
Cost Estimating Plan	v2		PO
Risk Mgt Plan	v1	October 2017	Risk Management Team
Config. Mgt Plan	v1		PO
Scope Mgt Plan	CDR draft	September 2017	PO
Outreach & Impacts	PEP Chap 1.4 & 2.6	Done	
Construction Mgt Pl	Draft	September 2017	Tuts
Systems Eng. Mgt Pl	30%	September 2017	Evans

Funding Priorities

- NSF funding to MREFC start set in operations cooperative agreement
- Within set envelope, budgets set based on best estimates available then
  - With RLS in hand, will revisit the numbers to optimize progress
  - Project office very high priority

Subsystem	Old CA	Year 1	Year 2	Year 3	Year 4	Total
Liquid Argon	520	695	986	863	100	3,164
Tile Calorimeter	576	468	472	670	114	2,300
Muon System	424	392	920	1168	169	3,073
Trigger System	-	329	413	520	144	1,406
Project Management	431	431	460	524	120	1,966
Total	1,951	2,315	3,251	3,745	647	11,909

- May need to react to current extraordinary circumstances

Pre-PDR Recommendations

Pre-PDR: Project Management

- Identify additional resources and increase percentage fractions of key people on this project; augment personnel supporting the project office, in particular project controls
  - Evolving:
    - Risk management team starting up, also frees up some of Hal Evans' time
    - Added budget analyst at BNL
    - Tuts chair term ends 6/30, so goes from 30% to 80% then
    - Evaluating budgetary picture to increase project controls resources without jeopardizing technical progress
- Work with LFO to develop clear list & schedule of deliverables for PDR
  - Started (Rebecca's feedback from pre-PDR)
  - Send documents to LFO again after significant updates, discuss in biweekly meetings with NSF

Pre-PDR: Project Management

- Project should clarify with the funding agencies what the overall review schedule [for PDR] can/should be, and clarify LFM requirements for the review
  - We will have v1 of the NSF part of the RLS scrubbed by ~mid June
    - Will tell us how much funding needed in April 2020-April 2021, impact of profile changes
  - Work with NSF to understand if any flexibility there
  - [CD-1 schedule in flux given uncertainties in FY18 budget
    - Likely not in early Fall]
  - Interpreting LFM requirements
    - See previous two slides
- Articulate a focused SEMP linked to the global process and provide the supporting documentation to demonstrate this topic is on-track for PDR/FDR
  - Agreed, underway, currently estimate 30% complete
  - And of course work with global ATLAS continuously

Pre-PDR: Project Management

- Establish and promote a risk-awareness culture, get the work underway, add resources for risk assessment (consultant?) as needed to make rapid progress. Many of the organizations involved have existing resources/experience which might be brought to bear. Project leaders have a clear understanding of the cost-contingency-scope-risk ecosystem. It is critical to promote this understanding to CAMs, L2-L3 leaders
  - Risk management team being put in place
  - Risk workshop held 5/8 with most L2 and L3 in attendance, planning dedicated scrubbing sessions for risk register
    - See clear evolution in understanding in teams
- Refine document quality [for example risk register] and ensure they are consistent with management plans. Identify a dedicated risk person.
  - Documents: yes, agreed
  - New risk management team: TBD and George Redlinger

Pre-PDR: Project Management

- In lieu of TDRs, understand the risks associated with these technical decisions and downselects
  - Agreed; these will be part of the risk register and simulation
- Practice. Use template and presentation order keyed to NSF LFO requirements
  - Yes!
    - Not enough time between RLS completion and reviews
    - Also too tight timeline between DR and pre-PDR

Pre-PDR: Cost/Schedule

- We recommend that CAM ownership and management utility be considered and emphasized. The PMCS information is not a substitute for management ownership and focus.
  - We fully agree, have emphasized this at review, keep emphasizing it to team
    - We see clear evolution in the past ~6 weeks (stimulated by review and regular scrubbing sessions)
- Use the trends to inform the cost estimate on a regular basis to revise the information. [Is part of previous bullet]
  - Also agreed, but at limited level between now and PDR, as not in position to do monthly status reporting yet
    - Start qualitative tracking in July
- Set a clear date for completion of RLS with inputs from subsystems. "Freeze" the P6 data at the earliest practical time before the PDR review to ensure creditable and consistent data
  - v1 end of June, v2 end of August

Pre-PDR: Cost/Schedule

- Maintain consistency and high quality throughout the remainder of the BOEs.
  - Agreed

Pre-PDR: Tile

- Maintaining the schedule for the TDAQ interface documents is critical
  - Deadline for comments for ATLAS main detectors-TDAQ interface document v2 just passed
    - Will be frozen in a few weeks - then under change control
  - Specifying hardware specs for interfaces to Global Event Processor now
    - Will have to be backward compatible with some Phase-1 boards, so we are already guaranteed that specification will work
  - Tile hardware specifications documents being finalized

Opportunities

- Funding appears adequate to accelerate parts of the project development?
  - In 2017, burn rate too high for current PM part of budget

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  - Will need to maintain project controls effort level going forward
  - Reduce R&D funding, but do not want to jeopardize technical progress to PDR
  - Use scope hold-back (shared between operations & upgrade)

Opportunities

- Consultant effort to achieve specific deliverables (e.g. Monte Carlo analysis) might be considered
  - We are exploring how this might be optimally applied
- Training students and investing in the next generation of leadership may benefit efforts now and are important for the future
  - An important part of what we do
  - Project offers an important opportunity for (base grant-funded) students and postdocs to acquire hardware R&D and production expertise

Threats

- Time remaining before PDR
  - We manifestly agree: time is short with lots of work to do
    - Adding effort, e.g. risk management team
    - Putting a lot of effort into training L3s, CAMs
      - We see significant progress, keep pushing
- RLS may modify project scope more than currently anticipated
  - Prepared to descope as necessary to ensure sufficient contingency for project completion
- International ATLAS changes to specifications may have a cascading effect
  - Changes to specifications are a generic risk
    - Work closely with international collaborators to mitigate
    - Account for in risk register & simulation
  - Learned a lot from Phase-1 about needing contingency to address international aspects

Threats

- Additional or evolving Two-agency requirements?
  - Main open item is crisp interpretation/implementation of LFM prescriptions
    - May require additional project office resources and coordination
- Evolving environment for science funding in US?
  - …